

THAT CLAIMED IS:

1. A power generation system comprising:
a rotor; and
a stator positioned adjacent the rotor, the stator
5 including a plurality of high voltage stator coils, each
of the plurality of stator coils including a plurality
of metal coil strands, a plurality of metal vent members
positioned adjacent to the plurality of coil strands,
and compact voltage grading means contacting each of the
10 plurality of vent members for grading voltage between
the plurality of vent members and the plurality of metal
coil strands to thereby prevent an overvoltage
condition.

2. A system as defined in Claim 1, wherein the
compact voltage grading means includes at least a first
conductive strip member contacting a conductive portion
of each of the plurality of vent members, a voltage
5 grading layer of material positioned to contact the
first conductive strip member, and at least a second
conductive strip member positioned to contact the
plurality of metal coil strands and the voltage grading
layer to thereby provide an electrical flow path between
10 the metal vent members and the metal coil strands.

3. A system as defined in Claim 2, wherein the
voltage grading layer includes a plurality of layers of
conductive tape, the plurality of layers including a
first layer of conductive tape positioned to adhere to
5 each of the plurality of vent members and the first
conductive strip member, and a second layer of
conductive tape positioned to adhere to the plurality of
vent members and the second conductive strip member.

4. A system as defined in Claim 2, wherein the
compact voltage grading means further includes
conductive filler material positioned to contact

surfaces of the plurality of coil strands, the first and
5 second strip members, and the voltage grading layer to
enhance decreasing of a voltage potential between the
plurality of metal strands and the plurality of metal
vent members.

5. A system as defined in Claim 4, wherein each of
the stator coils further includes bonding filler
material positioned to contact the conductive filler
material of the compact voltage grading means to bond
5 the compact voltage grading means to the plurality of
stator coils.

6. A system as defined in Claim 5, wherein each of
the plurality of vent members has tubular shape and are
positioned in a stacked relationship, and wherein the
plurality of metal coil strands are positioned on each
5 side of the stack of tubular-shaped metal vent members.

7. A high voltage stator coil for a stator of a
power generation system, the stator comprising:
Sub A
a plurality of metal strands;
a plurality of vent members positioned adjacent the
5 plurality of metal strands; and
compact voltage grading means contacting each of
the plurality of vent members and the plurality of metal
strands for grading voltage between the vent members and
the metal strands to thereby prevent an overvoltage
10 condition.

8. A stator coil as defined in Claim 7, wherein
the compact voltage grading means includes at least a
first conductive strip member contacting a conductive
portion of each of the plurality of vent members, a
5 voltage grading layer of material positioned to contact
the first conductive strip member, and at least a second
conductive strip member positioned to contact the

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Claim 10*

plurality of metal strands and the voltage grading layer to thereby provide an electrical flow path between the vent members and the metal strands.

9. A stator coil as defined in Claim 8, wherein the voltage grading layer includes a plurality of layers of conductive tape, the plurality of layers including a first layer of conductive tape positioned to adhere to each of the plurality of vent members and the first conductive strip member, and a second layer of conductive tape positioned to adhere to the plurality of vent members and the second conductive strip member.

10. A stator coil as defined in Claim 9, wherein the compact voltage grading means further includes conductive filler material positioned to contact surfaces of the plurality of coil strands, the first and second strip members, and the voltage grading layer to enhance decreasing of a voltage potential between the plurality of metal strands and the plurality of vent members.

11. A stator coil as defined in Claim 10, further comprising bonding filler material positioned to contact the conductive filler material of the compact voltage grading means to bond the compact voltage grading means.

12. A stator coil as defined in Claim 11, wherein each of the plurality of vent members has tubular shape and is positioned in a stacked relationship, and wherein the plurality of metal strands are positioned on each side of the stack of tubular-shaped vent members.

13. An overvoltage protector for a power generation system, the protector comprising:
at least a first conductive strip member positioned to contact one of a plurality of vent members;

5 a voltage grading layer of material positioned to
contact the first conductive strip member; and
 at least a second conductive strip member
positioned to contact the voltage grading layer and at
least one of a plurality of conductive coil strands
10 forming a portion of a high voltage coil.

14. A protector as defined in Claim 13, wherein
the voltage grading layer includes a plurality of layers
of conductive tape, the plurality of layers including a
first layer of conductive tape positioned to adhere to
5 each of the plurality of vent members and the first ~
conductive strip member, and a second layer of
conductive tape positioned to adhere to the plurality of
vent members and the second conductive strip member.

15. A protector as defined in Claim 14, further,
comprising a conductive filler material positioned to
contact surfaces of the plurality of coil strands, the
first and second strip members, and the voltage grading
5 layer to enhance decreasing of a voltage potential ~
between the plurality of metal strands and the plurality
of vent members.

16. A method of grading voltage between internal
vent members and conductive strands of a high voltage
coil of a power generation system, the method
comprising:

5 connecting conductive portions of each of a
plurality of internal vent members to a plurality of
conductive strands of a high voltage coil.

17. A method as defined in Claim 16, wherein the
connecting step for each vent member includes:

 forming an opening in insulation surrounding the
vent members;

5 positioning a first conductive strip member to contact conductive portions of the vent member;
positioning a voltage grading layer of material to contact and overlie the first conductive strip member; and

10 positioning a second conductive strip member to contact the voltage grading layer and at least one of the plurality of conductive strands.

18. A method as defined in Claim 17, wherein the voltage grading layer includes a plurality of layers of conductive tape, and wherein the step of positioning the voltage grading layer includes adhering a first layer of
5 conductive tape to the first metal strip member and the insulation surrounding the vent member and adhering a second layer of conductive tape to the insulation and the second conductive strip member. -

19. A method as defined in Claim 18, further comprising the step of positioning conductive filler material to contact the plurality of conductive strands, the first and second conductive strip members, and the
5 first and second layers of voltage grading layer.